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Cross-Reference to Related Applications

Background of the Invention

The present invention relates to an individual wrapping body for wrapping an interlabial pad in which the number of live microorganism is suppressed and an exterior container for enclosing two or more of the individual wrapping body.

Conventionally, a sanitary napkin and a tampon are used generally as sanitary products for female. Here, there have been great efforts made to prevent the leak of menstrual blood from gap caused by poor adhesion near the ostium vaginae as for the sanitary napkin. Moreover, as for the tampon, there have been great efforts made for relieving the foreign feeling and the discomfort when wearing the sanitary products and intervaginal wearing trouble due to the nature of those products.

Under such situation, sanitary products of the interlabial pad have attracted people as a sanitary product positioned between the sanitary napkin and the tampon in recent years.

The interlabial pad is fixed by inserting it between the labia, having characteristics that it is difficult to cause the leak of menstrual blood because of higher adhesion to the body than that of the sanitary napkin and psychological resistance thereof on wearing is lower than that of the tampon which is inserted into the vagina.

An example of sanitary products requiring a disinfected sanitary state is a tampon which is used by being inserted inside the vagina. Tampons are individually wrapped and then sterilized thereby preventing microorganism from entering inside the vagina from outside through the product. Therefore, the state of equilibrium of indigenous microorganism can be maintained even when wearing a tampon, thereby keeping the sanitary state.

Tampons can be broadly divided into two groups such as an applicator tampon, which is inserted inside the vagina using an applicator, and a finger-type tampon which is inserted inside the vagina using fingers.

As for the former, there is no chance that the tampon comes to be in contact with fingers of a wearer or the like at least until the insert, so that the sanitary state after the sterilization can be maintained. However, as for the latter, it is common that a wearer hold the tampon for insert by the thumb and middle finger and then insert it by the forefinger to which an enclosed finger cap is applied. Therefore, although entering of microorganism inside the vagina through the forefinger can be prevented, the tip of thumb and middle finger holding the tampon are to be in contact with the tampon.

Accordingly, although it depends on each individual, the state of equilibrium of the indigenous microorganism near the labia is disturbed so that microbes may easily propagate, which may cause to contract a disease in external genitalia and internal genitalia including the labia.

Summary of the Invention

The present invention has been designed to overcome the foregoing problems. An object of the present invention is to provide an individual wrapping body for wrapping an interlabial pad, which can keep the sanitary state of female labia, and an exterior container for enclosing the individual wrapping body.

The present invention provides an interlabial pad in which the number of live microorganism which thrive before being used is suppressed and its individual wrapping body and wrapping container.

Also, the present invention can provide an interlabial pad having a wearing-handling property in which there is no need for the fingers or the like of a user to be in contact with the face of the interlabial pad facing to the skin. Therefore, in the interlabial pad, the state of equilibrium of the indigenous microorganism near the labia can be maintained.

More specifically, the present invention provides the followings.

An individual wrapping body includes an interlabial pad with a size capable of being smoothly inserted between female labia; and an individual wrapping body for covering and enclosing the whole portion of the interlabial pad, wherein a processing for suppressing the number of live microorganism is applied to the interlabial pad during manufacturing and/or after manufacturing, and the number of live microorganism is

suppressed to equal to 100 or less even after a period of six months from the manufacture.

In the interlabial pad, the number of live microorganism is suppressed to be 100 or less even 6 months after the manufacture. Therefore, by wearing the interlabial pad, the state of equilibrium of the indigenous microorganism near the labia is not to be disturbed, thereby further decreasing the risk of contracting diseases in the external genitalia and internal genitalia.

Examples of the measure for suppressing the number of live microorganism are disinfection processing, manufacturing under aseptic condition, and using antimicrobial agent.

Examples of the disinfection processing are gassing, an irradiation method, and a radiation method. Gassing is a method in which microbes are killed using ethylene oxide, formaldehyde, hydrogen peroxide or other gases.

Examples of irradiation method also include ultraviolet method, high frequency method and electron ray method. The ultraviolet method is a method for perishing the microbes by irradiating ultraviolet rays. The high frequency method is a method for perishing the microbes through the heat generated by directly applying the high frequency. The electron ray method is a method for perishing the microbes by irradiating the electron rays. The radiation method is a method in which microbes are perished by irradiating radiation such as gamma radiation from the source including radioactive isotope element.

sheet; and an unbonded area in the lateral direction of the back side sheet; the unbonded area forming an opening for inserting a finger between the mini sheet piece and the back side sheet.

In the interlabial pad according to the embodiment, a mini sheet piece is attached on the garment side face. As for the mini sheet piece, in the lateral direction of the back side sheet, at least one of both sleeve ends of a mini sheet piece is unbonded with the face of the back side sheet. Thus, there is a sleeve opening formed between the one of the sleeve portion of the mini sheet piece and the back side sheet which are unbonded. The sleeve opening serves as an opening for inserting a finger (see Fig. 5) to which a finger can be inserted.

In the longitudinal direction of the back side sheet, the mini sheet piece is bonded only on the right and left hand sides of the back side sheet, and the inside is unbonded (not pasted). Therefore, the mini sheet piece is attached over the area from one side to the other side of the back side sheet. In the area from one side to the other side, a space is formed (finger insert space) to which a finger can be inserted for holding.

In the lateral direction of the back side sheet, if both of the sleeve ends of the mini sheet piece are unbonded with the back side sheet, the space for inserting finger becomes a through hole (a tunnel). When one of the sleeve ends of the mini sheet piece is bonded, the space for inserting finger becomes a non-through cave.

If the mini sheet piece comprises a plurality of pieces, the number of the bonding area on the right and left hand sides increases on the back side sheet in the longitudinal direction according to the number of the pieces. For example, if there are two mini sheet pieces, two bonding areas are provided on each side.

In an implementation of the present invention, "side area" of the back side sheet in the longitudinal direction include not only the area corresponding to the peripheral edge of the interlabial pad but also the neighborhood of the peripheral edge where the mini sheet piece can be bonded.

As described, according to the embodiment, the mini sheet piece is attached to form the opening for inserting a finger and the continued gap for finger insert. Therefore, by inserting a finger to the opening for inserting a finger, the interlabial pad can be temporarily fixed to the tip of a finger. In this case, the opening for inserting a finger is formed to be the aperture with the finger breadth of the wearer so that the flat-shape finger tip is to be inserted to naturally be in contact with the face of the sheet without facing the different direction from the face of the sheet. In other word, in the interlabial pad according to an implementation of the present invention, the opening for inserting a finger has a widespread shape towards the direction of the sheet surface as in the finger tip shape of the wearer. Therefore, the finger insert direction of the wearer is specified thereby leading the wearer to detect the wearing point by the ball of finger. Thus, even when wearing the pad between the labia, which is a place hard to view, the interlabial pad can be inserted to an appropriate position while accurately detecting a precise wearing position. In addition, when wearing the interlabial pad inside the labia, the interlabial pad can be inserted by detecting between the labia using the inserted finger so that there is little risk that a finger accidentally touches the surface side sheet or taking too much time for wearing. For the reasons described above, there is little risk that microorganism attaches the surface side sheet and, in addition, microorganism enter the labia.

Incidentally, JP-A-Hei 6-506368 discloses a pad for preventing incontinence of urine in which a bag shaped hole for inserting a finger is provided on the opposite side surface to the body side. However, it mentions, regarding the above described opening for inserting a finger, that "it is crushed in a normal state and spread open after inserting a finger". This indicates that the hole is closed in a normal state (see Fig. 29). Therefore, a finger cannot be inserted without making the finger face in the direction with a right angle to the pad for preventing incontinence of urine (see Fig. 30). The ball of finger cannot face the interlabial pad side unless the finger is turned around after inserted. However, when performing this action, the pad for preventing incontinence of urine is turned around together with the finger unless the pad for preventing incontinence of urine is supported by the other hand. Hence, the finger cannot be set in the desired position.

As described, unlike the present invention, the finger insert direction of the opening for inserting a finger provided in the above-described pad for preventing incontinence of urine is specified to form the right angle against the sheet surface. Therefore, the finger is not inserted with the ball of finger facing the sheet surface in the first place. Thus, the effect of simple and rapid wearing cannot be sufficiently achieved.

In an implementation of the present invention, the position of the opening for inserting a finger can be changed appropriately. However, it is desirable to provide the positioning such that the size of the finger insert gap continued from the opening for inserting a finger becomes sufficient for inserting a finger to fix and support the interlabial pad (the wearer can feel the finger as one body with the interlabial pad).

In this Specification, the "finger breadth" specifically means "the width of a finger in the direction of the finger spread" but not the thickness of the finger. The "finger breadth-opening" is an opening having a size sufficient for inserting a finger.

Also, the finger breadth-opening "is directly provided" in the face direction of the interlabial pad means that the interlabial pad itself is formed to be in a suitable shape primarily in the case where a finger is naturally inserted to the interlabial pad for wearing the interlabial pad (in an implementation of the present invention, when inserting a finger with the ball of finger facing the sheet surface of the back side sheet). Therefore, it can eliminate such case that, as in the above-described related art, the wearer can only obtain the opening of the finger breadth in the surface direction by inserting the finger and then turning around the finger, in which the finger breadth-opening is secondarily formed in the surface direction of the back side sheet.

An individual wrapping body can be provided such that the interlabial pad is folded and enclosed such that the opening for inserting a finger opens.

In a sheet shaped sanitary product such as a napkin, it is common that the content is folded and wrapped for minimizing the size of the wrapping body. However, in an implementation of the present invention, in addition to minimizing the size, there is an effect obtained in which the opening for inserting a finger is to be naturally opened by simply opening the folded interlabial pad. The opening for inserting a finger is naturally opened so that it becomes easy to insert the finger by recognizing the opening for inserting a finger. Thus, there is little risk that the finger accidentally touches the surface side sheet or the wearer takes too much time for wearing. As a result, there is little risk

that the microorganism attach to the surface side sheet, and that the microorganism enters the labia.

An individual wrapping body can be further provided so that an interlabial pad is positioned such that the opening for inserting a finger is positioned to face the opening of the individual wrapping body.

The interlabial pad is positioned inside an individual wrapping body such that a finger can be inserted to the opening for inserting a finger upon opening the individual wrapping body. Hence, the interlabial pad is easily taken out from the individual wrapping body. The interlabial pad may be, for example, folded in two or may not be folded. When folded, it may be folded in the longitudinal direction or in the lateral direction. When the wearer opens the wrapping body and takes out the interlabial pad from the wrapping body, there is no way that the finger touches the surface side sheet. As a result, there is little risk that the microorganism attaches to the surface side sheet and that the microorganism enter the labia.

An exterior container, including a package for packaging two or more of the individual wrapping bodies, is provided such that the package includes a main body of a container and a lid capable of opening and closing for covering an opening part of the main body of the container.

By using a package, a plurality of individual wrapping bodies can be sold as a unit and preservation of the individual wrapping body becomes easy. The package may have an airtight characteristic sealing the interlabial pad or may be air-permeable.

After opening the opening part of the main body of the container, by covering the opening part with a lid capable of opening and closing, dropping and mixing of

contamination such as floating dust and floating microbes (microbes in the air) can be decreased to an extreme extent. Thereby, the pad can be preserved under a sanitary environment.

An exterior container can be provided such that the package includes an over-wrapping for covering at least the main body of the container.

Even if there is a gap between the main body of the container and the lid, the gap can be covered by over-wrapping. By using the over-wrapping, entering of the microbes in the air to the interlabial pad becomes more difficult. It is preferable that the over-wrapping covers most of the part or the whole portion of the main body of the container and the lid.

An exterior container can be provided such that the main body of the container of the package is bonded with at least a part of the lid.

Opening and closing of the lid become easy so that the individual wrapping body inside the main body of the container can be easily taken out. The lid is not completely separated from the main body so that not only opening and closing can perform rapidly, but also no chances that the lid is lost and that the lid cannot be found immediately. As a result, the opening of the main body of the container can be surely and easily covered. Thereby, decreasing the dropping and mixing of the contamination such as floating dust and floating microbes (microbes in the air) to an extreme extent and the pad can be preserved under a sanitary environment.

An exterior container can be provided such that the main body of the container of the package and the lid are continuously formed; and the package is formed by folding the lid towards the main body of the container.

The main body of the container and the lid, for example, are formed by a piece of cardboard. There may be the case where the cardboard is folded and composed to form a package. It can be manufactured at a low cost.

Brief Description of the Drawings

Fig. 1 is a cross section showing the inner structure of an interlabial pad;

Fig. 2 is a plan view showing the top face (body side) of the interlabial pad;

Fig. 3 is a perspective view showing the reverse surface (garment side) of the interlabial pad;

Figs. 4(A-D) are cross sectional explanatory illustrations for describing the attaching position of a mini sheet piece of the interlabial pad;

Fig. 5 is a perspective view showing the state where a finger is inserted to a finger insert pocket provided in the interlabial pad;

Fig. 6 is a perspective view showing the state of wearing the interlabial pad between the labia;

Fig. 7 is a plan view showing the state where the mini sheet piece attached to the interlabial pad has a length of 10 percent or more in the longitudinal direction;

Fig. 8 is a perspective view showing the open state of an individual wrapping body which wraps an interlabial pad with the back side sheet being folded inside;

Fig. 9 is a perspective view showing the open state of the case where the interlabial pad according to the embodiment is wrapped in an individual wrapping body which opens as a set of folded doors;

Fig. 10 is a perspective view showing the open state of an individual wrapping body which wraps an interlabial pad with the surface side sheet being folded inside;

Figs. 20(A) and 20(B) are perspective views showing a package according to a further embodiment, while Fig. 20(A) shows the state where a lid is closed and Fig. 20(B) shows the state where the lid is slightly open;

Figs. 21(A) and 21(B) are explanatory illustrations of over-wrapping while Fig. 21(A) shows the state before the application of over-wrapping and Fig. 21(B) shows the state after the application of over-wrapping;

Figs. 22(A) and 22(B) are explanatory illustrations of a package with a sealing member while Fig. 22(A) shows the state where the lid is open and Fig. 22(B) shows the state where the lid is closed;

Figs. 23(A), 23(B), and 23(C) are explanatory illustrations of a package according to the embodiment while Fig. 23(A) shows the unfolded view of the package according to the embodiment, Fig. 23(B) shows a perspective view of the package according to the embodiment during the composing step, and Fig. 23(C) is a perspective view showing the state after the package is composed;

Figs. 24(A), 24(B) and 24(C) are explanatory illustrations of the over-wrapping while Fig. 24(A) is a perspective view showing a gap, Fig. 24(B) is a perspective view showing the state before wrapping, and Fig. 24(C) is a perspective view showing the state after wrapping;

Fig. 25 is a perspective view showing the experimental state of separation force measurement of an anti-shift tape;

Fig. 26 is a perspective view showing the experimental state of shearing force measurement of an anti-shift tape;

Fig. 27(A) is an explanatory illustration showing an example of an embodiment of the individual wrapping body in plan view;

Fig. 27(B) is a cross section along the line I-I;

Fig. 28 is a perspective view showing the state of gas entering inside the package;

Fig. 29 is a perspective view showing the state of an example of a pad for preventing incontinence of urine with an opening for inserting a finger according to the related art; and

Fig. 30 is a perspective view for describing the state of finger insert of in the pad for preventing incontinence of urine with an opening for inserting a finger according to the related art.

Best Mode of Carrying Out the Invention

Now, the embodiment of the present invention will be described by referring to the drawings.

Fig. 1 is an illustration showing the inner structure of an interlabial pad according to the embodiment. Fig. 2 and Fig. 3 are illustrations showing the appearance of the interlabial pad according to the embodiment. Fig. 2 is an illustration showing the body side face of the interlabial pad according to the embodiment and Fig. 3 is an illustration showing the garment side face of the interlabial pad according to the embodiment. Fig. 5 and Fig. 6 are explanatory illustrations showing the state of using the interlabial pad.

Basic Structure

An interlabial pad 1 according to the embodiment, as shown in Fig. 1, comprises a surface side sheet 11 made of a permeable material, a back side sheet 12 and an absorber 13. The surface side sheet 11 and the back side sheet 12 are bonded in a peripheral edge

15 so as to seal the absorber 13 inside thereby forming an absorber layer 2 as one body. The surface side sheet 11 and the back side sheet 12 are bonded by heat embossing and/or hot melt adhesive. The absorber 13 is pasted to each sheet so as to prevent the interlayer separation between the surface side sheet 11 and the back side sheet 12.

Incidentally, the above-described interlayer separation can be prevented by pasting the surface side sheet 11 and the back side sheet 12 in the inner edge except for the peripheral edge 15. Also, under a wet condition, the interlayer separation is likely to occur. In order to prevent this, it is more preferable to use heat embossing. Heat embossing can be used in dots or screen pattern without limit. By bonding them with the embossing surface ratio from 3 to 20 percent, it becomes possible to keep the moist strength without interrupting the permeability.

The interlabial pad can be used, in addition to absorbing menstrual blood, for absorbing secretion (vaginal discharge) other than the blood discharged from the ostium vaginae. Also, it can be used for absorbing urine excreted from the urethra located between the labia like the ostium vaginae, that is, as a pad for preventing incontinence of urine.

The shape of the interlabial pad according to the embodiment may be in any shapes such as elliptic-, ovoid-, gourd-, or drop-shape as long as it is suitable to be fixed in between the labia. Also, it may have a three-dimensional structure with a projection in a convex shape or the like for tightly fixed to the labia. In order to fix it to the labia more tightly, there may be an adhesive or the like for fixing the pad to the body applied to the surface side sheet.

Protruded Area

There may be a protruded area protruding towards the body side in the center of the above-described surface side sheet in the lateral direction.

In the embodiment, the finger insert direction is to be specified so that the ball of finger of the wearer is facing the surface sheet to be inserted. Thus, the concave between the labia can be precisely detected by the ball of finger (especially the fingerprint part) with a keen sense so that the protruded area with a convex shape readily provided on the surface side sheet can be appropriately fixed between the labia. Therefore, it becomes possible to increase the adhesion between the body and the interlabial pad thereby decreasing the menstrual blood leak to the outside. Furthermore, the substantial flat area other than the protruded area is fixed by being positioned to cover the pudenda thereby enabling to shield the menstrual blood flow from the lateral direction.

Embodiment Regarding the Size

As shown in Fig. 3, on a garment side face 12a of a back side sheet 12, a mini sheet piece 14 covering about 2/3 of the above-described back side sheet 12 is attached to form a pocket 16 by bonding an outer edge 17 except for an opening 19a for inserting a finger. Specifically, the center dimension of the absorber layer 2 in the longitudinal direction is 85 mm while the center dimension of the mini sheet piece 14 in the longitudinal direction is about 55 mm. The back side sheet 12 has the area within the range of about 30 mm in the longitudinal direction, which is not covered by the mini sheet piece 14.

It is preferable that the length of the interlabial pad in the lateral direction be 10 to 60 mm and more preferable to be 30 to 50 mm. In this case, if it is longer than 60 mm, the edge of the interlabial pad and the thigh of the wearer come to be in contact thereby

causing friction between them every time the wearer makes a move. Furthermore, if the friction exceeds the strength of the labia itself holding the interlabial pad, there is a risk that the interlabial pad is fallen off from between the labia. Also, if it is shorter than 10 mm, the interlabial pad cannot have the sufficient area or volume to be inserted between the labia so that the interlabial pad may easily fall off.

It is preferable that the length of the interlabial pad in the longitudinal direction be 60 to 150 mm and more preferable to be 80 to 120 mm. In this case, if it is longer than 150 mm, the contact surface between the garment side face of the interlabial pad and the underwear or the like becomes too large. Therefore, there generates the friction larger than the holding strength of the labia itself for holding the interlabial pad. As a result, the interlabial pad may fall off. Also, if it is shorter than 60 mm, the interlabial pad cannot have the sufficient area or volume to be inserted between the labia so that the interlabial pad may easily fall off.

It is preferable that the thickness of the interlabial pad according to the present invention be 0.5 to 20 mm and more preferable to be 2 to 10 mm. The interlabial pad is to be inserted between the sensitive labia so that, if the thickness is 20 mm or more, the wearer may feel the foreign feeling when wearing. On the other hand, if it is 0.5 mm or less, the capacity of the included absorber may become insufficient for absorbing menstrual blood. Thereby, there may be a case where menstrual blood is permeated through the interlabial pad.

Mini Sheet Piece

The mini sheet piece 14 is attached on the above-described back side sheet 12 so as to form a pocket.

According to the embodiment, by simply bonding a mini sheet piece, which is shorter than the back side sheet in the longitudinal direction and equal in the lateral direction, with the back side sheet in the outer edge, it becomes possible to provide a gap to which a finger can be inserted with the ball of finger (especially the fingerprint part) facing the surface side sheet. Therefore, it is unnecessary to go through a specifically complicated manufacturing process in order to provide a finger insert gap so that a decrease in the productivity can be avoided.

Also, the back side sheet and the mini sheet piece are adhered in the area where the finger tip part comes to be in contact. Thus, such a case can be avoided precisely that the finger tip touches the menstrual blood at the time of wearing.

The "pocket" in this Specification means a closed member to which a whole portion of finger can be smoothly inserted. Preferably, the cross section of it is in a flat shape or something similar, however, it is not limited to these but other shapes such as semicylindrical shape may be employed.

As for the mini sheet piece, in order for the wearer to be able to easily distinguish the mini sheet piece, it can be provided to have a color, pattern, and hue different from those of the back side sheet of the interlabial pad using methods such as coloring or printing of patterns.

The above-described mini sheet piece has the length of 10 percent or more of the above-described interlabial pad in the longitudinal direction, preferably 10 to 80 percent and more preferably 30 to 60 percent.

According to the embodiment, the state at the time of inserting the finger from the opening for inserting a finger provided in the interlabial pad to the gap (finger insert gap)

In the preferable embodiment, the surface side sheet and the back side sheet are bonded in each of the peripheral edges. In this case, it is preferable that the absorber be not sandwiched in the peripheral edge where the sheets are bonded. To achieve this, the surface side sheet and the back side sheet are bonded so that, for example, the absorber is sealed to be in a closed state.

At this time, it has to be careful so that the absorber is not sandwiched in the bonding in the peripheral edge. In this regards to this, if the absorber is sandwiched when bonding in the peripheral edge, the peripheral edge may become stiff. However, it can be avoided by providing the bonding area as described, and the preferable wear feeling is achieved. The dimension of the absorber, in order for the absorber to be not sandwiched in the above-described peripheral edge, may be the same as that of the interlabial pad or may have a smaller dimension providing a gap of 2 to 10 mm from the outer rim of the interlabial pad.

Finger Insert Pocket

By inserting a finger to a pocket 16 formed by the back side sheet 12 and the mini sheet piece 14, as shown in Fig. 5, the finger can be inserted with the fingerprint surface side from the first joint up being in contact with the garment side face 12a of the back side sheet 12. Thus, as shown in Fig. 6, when leading the interlabial pad to the labia, the concave and convex of a labia 18 can be detected by having the body side face 11a of the surface side sheet 11 being in contact with the labia so that the pad can be more precisely led inside the labia with a concave shape.

The mini sheet piece 14, as shown in Fig. 7, has the length of 10 percent or more of the absorber layer 2 in the longitudinal direction. Thereby, it can made clear that the

finger insert direction is A direction. In this respect, "mini sheet piece 14 with the length of 10 percent or more" serves as the indication of the finger insert in the interlabial pad according to the present invention.

It is preferable that the above-described mini sheet piece has a stretching characteristic or elastic flexibility at least in the lateral direction of the back side sheet.

According to the embodiment, if the finger tip size of the wearer is larger than the provided opening for inserting a finger, the mini sheet piece stretches at least in the lateral direction. Therefore, regardless of the finger tip size of the wearer, the interlabial pad according to the present invention can be used effectively.

In order to provide the mini sheet piece with the stretching characteristic, a stretch spun bond nonwoven fabric can be used, whose stress is 0.1 to 0.5 N/25 mm at the time of 5 percent stretching when being stretched at a constant testing speed of 100 mm/min with the grip interval of 100 mm.

On the other hand, in order to provide the mini sheet piece with the elastic flexibility, a fabric sheet or a film sheet in which a thermoplastic elastomer resin is used may be used. Also, an elastic flexible material such as the thermoplastic elastomer resin or natural rubber may be used alone or may be used by mixing it with a non-elastic flexible material.

The whole girth of the inside of the above-described opening for inserting a finger may be 30 to 100 mm, and more preferably to be 40 to 80 mm.

In the case where the whole girth of the inside of the above-described opening for inserting a finger is shorter than 30 mm, the opening for inserting a finger itself becomes small thereby causing a trouble when putting a finger in and out. On the other hand, if it

is longer than 100 mm, the interlabial pad cannot be fixed to the finger. Therefore, it becomes difficult for the ball of finger to be surely in contact with the sheet surface thereby causing a trouble when wearing.

Individual wrapping body

In the present invention, an individual wrapping body for covering the whole portion of the interlabial pad is used. The individual wrapping body has a sealing property in which microbes or contamination hardly enter. In the individual wrapping body, the interlabial pad is positioned in such manner that the interlabial pad is easily worn upon opening the opening of the individual wrapping body. In other words, it is preferable to have a structure in which the interlabial pad can be easily taken out from the individual wrapping body without a contact with the surface side sheet of the interlabial pad by using a form (for example, mini sheet piece) in which the user can easily achieve wearing.

Specifically, in the case where the interlabial pad has a finger-cot shape to which a finger can be inserted, a finger can be inserted and fixed with the inside of the finger tip facing the back side sheet of the interlabial pad upon opening the individual wrapping body. The interlabial pad can be taken out from the individual wrapping body while being fixed to the finger tip. In short, the opening of the individual wrapping body stands in the same direction as the finger tip insert direction of the interlabial pad in which the number of live microorganisms is suppressed and is wrapped in the individual wrapping body.

When using a gas disinfection method as a disinfection method, at least a part of bonding area of the individual wrapping body is adhered in dots or the like thereby

providing a breathing characteristic. Thereby, the interlabial pad inside the individual wrapping body can be disinfected.

Next, the individual wrapping body wrapping the interlabial pad to which the mini sheet piece for finger insert is attached will be described by referring to Fig. 8 to Fig. 16.

In an individual wrapping body 40 for wrapping the interlabial pad according to the embodiment, the interlabial pad is folded in two and the mini sheet piece 14 is positioned to be near an opening 41. The pocket 16 for finger insert is also positioned near the opening 41 and, in addition, the interlabial pad 1 is wrapped facing in a different direction of the individual wrapping body 40 so that the pocket 16 naturally opens. Therefore, upon opening, an opening for inserting a finger 19a is opened. Thus, a wearer can insert the finger immediately with the ball of finger being in contact with the back side sheet 12.

The individual wrapping body, for example, may be an individual wrapping body 42 in a form of a set of folded doors as shown in Fig. 9 or an individual wrapping body 44, as shown in Fig. 10, which is opened by stripping off the top part as long as the finger of the wearer can be inserted to the pocket provided in the inter labia pad 1 immediately after opening. As shown in Fig. 9, the pad may be folded in two along the longitudinal direction with the surface side sheet 11 being the outer side or, as shown in Fig. 10, or may be folded in two along the longitudinal direction with the surface side sheet 11 being the inner side.

It may be an individual wrapping body 46 or 47 as shown in Fig. 11 and Fig. 12, which is opened by stripping off the top part. In Fig. 11 and Fig. 12, the interlabial pad is

folded in two in the lateral direction. Fig. 11 shows the case where a shallow pocket is provided and Fig. 12 shows the case where a deep pocket is provided. Also, when it is folded in the longitudinal direction, an opening may be provided in the individual wrapping body and the interlabial pad may be taken out. Furthermore, as shown in Fig. 13, the interlabial pad in a wrapping body 48 may not be folded at all. The shape of the interlabial pad wrapped inside when being wrapped is not specifically limited as long as it can be wrapped in the state where a finger can be inserted upon opening.

Also, the interlabial pad, as shown in Fig. 14, may be folded in two along the longitudinal direction to be enclosed in an individual wrapping body 50 and the four sides may be sealed. Or it may be left open along the stitches 51 in the arc. Peripheral edges 52 and 53 are bonding areas by embossing, hot melt adhesive or the like. On one side of the individual wrapping body, where there is a back side sheet (finger tip insertion opening) of the interlabial pad, a breaking surface (stitched) which is selectively broken by outer pressure is applied. Thereby, cut can be easily opened.

In Fig. 15, an individual wrapping body 55 has a substantial quadrilateral shape and the interlabial pad is folded in two in the longitudinal direction to be enclosed. There are stitches on the peripheral edge 56 in the longitudinal direction. The peripheral edges 57 and 58 in the lateral direction are bonded by embossing, hot melt adhesive or the like.

Fig. 16 shows an individual wrapping body 60 made of a polyethylene film. As an opening other than providing stitches, for example, as shown in Fig. 16, an adhesive capable of re-sealing can be used as well. Fig. 16(A) shows the state where a lid 62 of the individual wrapping body is folded. The lid 62 covers over an edge 69 of a pocket 68 of the individual wrapping body. The lid 62 is fixed by a hot melt 64 capable of re-sealing to

PE with a specific weight per unit area of 10 to 30 g/m², a perforated plastic film with the perforation rate of 10 to 30 percent and a specific weight per unit area of 15 to 30 g/m².

The inner surface side material and the outer surface side material of the above-described individual wrapping body are formed to be one body by a laminate processing using a method well known to those skilled in the art such as a hot melt adhesive, heat embossing and ultrasonic sealing. At this time, in the case of using a hot melt adhesive, it is preferable to apply the adhesive in spiral or lines with the application amount of 3 to 10 g/m² and the application face ratio of 5 to 40 percent. In the case of using heat embossing or ultrasonic sealing, it is applied in the arrangements of lines, dots, or cross-lines, with the sealing surface ratio of 5 to 20 percent. It is to consider the texture of the laminated material.

Also, with the consideration of the convenience for the users, it is preferable to be able to flush down the individual wrapping body after taking out the interlabial pad. The preferable materials to be used are a film sheet of polyvinyl acetate (PVAC), polyvinyl alcohol, methylhydroxypropylcellulose (MHPC) or the like, a water dispersible nonwoven fabric obtained by laminating these materials, a tissue, and a water soluble paper.

The individual wrapping body may be formed of a biodegradable material and/or a water soluble material and/or a water dispersible material.

If the individual wrapping body is formed of a water soluble material or a water dispersible material, the individual wrapping body can be flushed down to the toilet. Therefore, wearers can be freed from the complication of discarding the individual

wrapping body and a decrease in the trashes in the toilet can be achieved at the same time.

Specific examples of such individual wrapping body are a composite material obtained by laminating tissue with a specific weight per unit area of 15 to 40 g/m² and polyvinyl alcohol with a specific weight per unit area of 20 to 50 g/m², and then applying 0.5 to 1 μ m of silicone on the polyvinyl alcohol side, and a spun bond nonwoven fabric with a specific weight per unit area of 15 to 40 g/m² using poly lactic fiber as the main component.

Package

Provided is a package capable of enclosing and maintaining the disinfected interlabial pad sealed inside the individual wrapping body. The structure of the package is not specifically limited as long as it comprises a main body of the container and a lid with a structure to which contaminations cannot enter from outside into the inside of the container before being opened and the lid is capable of covering the opening of the container even being repeatedly opened and closed after opening the package so that entering of contaminations can be decreased as much as possible. It is not necessary that the main body of the container and the lid are formed separately but they may be formed continuously.

To specifically describe the container which can be used by being repeatedly opened and closed, it is preferable to comprise a main body 72 of the container and a lid 74. The lid 74 comprises a top face 76 and a side face 77 which stands from the peripheral edge of the top face. It may have a screw cap structure (Fig. 17) in which screw grooves 73 and 78 are provided in the main body 72 of the container and the lid 74.

blending proportion of the synthetic resin is kept relatively small so that the fiber rigidity is maintained even if it becomes wet by menstrual blood and, if it is unnecessarily large, the inner wall of the labia may be harmed by the high fiber rigidity. It is preferable that the synthetic fiber is selected from the group comprising filament such as polypropylene (PP), polyethylene (PE), polyethylene terephthalate (PET), fiber formed of a graft polymer of PE and PP, a compound synthetic fiber with a sheath-core structure in which the core is PP or PET and the sheath is PE, an eccentric-type sheath-core structure and side-by-side structure. Also, it is preferable to use it by making it milky by mixing a filler made of titanium oxide, calcium carbonate and the like within the range of 0.5 to 10 percent by mass if necessary.

The fiber used for the above-described spun lace nonwoven fabric is selected from natural cotton with the fiber length of 15 to 60 mm, rayon or acetate with the fiber length of 25 to 51 mm, and the fineness of 1.1 to 6.6 dtex. In this case, if fiber with a high specific surface area is used, the contact area between the inner wall of the labia can be increased. Thus, it is preferable that falling off of the pad from the labia can be decreased. For example, it is preferable to use rayon or acetate whose cross sectional shape of the fiber is a variant cross sectional shape such as Y-shape or C-shape. By providing the cross sectional shape to be a variant cross sectional shape, not only the specific surface area is increased compared to that of a complete circle but also the gap between the fibers are increased. Therefore, the rigidity of the surface side sheet is decreased so that the adhesion between the inner wall of the labia is improved. Accordingly, it is preferable that the risk of falling-off the pad from the labia and menstrual blood leak can be decreased.

An example of the preferable absorber is a nonwoven fabric sheet obtained by mixing and laminating 60 to 90 parts by mass of rayon or acetate with fineness of 1.1 to 6.6 dtex and 10 to 40 parts by mass of highly absorptive polymeric fiber, and then entangled and formed to be a sheet by needling, with a specific weight per unit area of 50 to 250 g/m² and the bulkiness of 2 to 5 mm. When this nonwoven sheet is enclosed inside the pad, it is possible to adjust the bulkiness by stacking or folding when necessary.

It is preferable for the absorber, although any material can be used as long as it is capable of absorbing and holding liquid (body fluid), to be bulky, hard-to-be deformed, less chemically stimulant, and highly flexible to fit into the labia. Specifically, a nonwoven sheet in which, 50 to 150 g/m² of pulp selected from the range of the fiber length of 1 to 10 mm is laminated on the garment face side and, on the body surface side, 150 to 250 g/m² of a mixture obtained by mixing 60 to 90 percent of rayon with 1.1 to 4.4 dtex fineness and 20 to 51 mm fiber length with 40 to 10 percent of natural cotton by this mixing ratio is laminated, which then to be formed into a sheet by dotted embossing to have 2 to 10 mm bulkiness, and more preferable to have 3 to 5 mm bulkiness. Thereby, liquid can be easily transmitted from the body surface side to the garment surface side resulting in the improvement of the absorbing and holding capacity. Furthermore, by providing a mesh spun lace nonwoven fabric of rayon with 1.1 to 4.4 dtex fineness and 25 to 51 mm fiber length by a specific weight per unit area of 15 to 40 g/m², the liquid transmitted from the body surface side can be dispersed by the mesh spun lace to be induced to almost all over the region of the pulp layer. Therefore, more liquid can be effectively absorbed.

Material for Mini Sheet Piece

The material used for the mini sheet piece is not specifically limited as long as it has a sheet structure such as a fabric, a nonwoven fabric, or a plastic sheet. However, it is preferable to be a sheet structure in which surface contact area is decreased by surface concave-convex processing such as embossing, application of pleats or craters. Also, it is preferable that the sheet structure has a stretching characteristic or flexibility in the lateral direction.

Examples of the material forming the mini sheet piece are natural fibers such as cotton, silk, and hemp, examples of the regenerated fibers are regenerated cellulose fiber, rayon, cuprammonium rayon, and examples of synthetic fibers are polyolefin containing fiber, polyester system fiber, polyamide containing fiber (nylon or the like), polyvinyl alcohol containing fiber, polyacrylonitrile containing fiber, and polyurethane.

Especially, when the mini sheet piece is formed of the nonwoven fabrics, web forming can be performed either by dry method (carding, spun bonding, melt-blown, air-laid and the like) or wet method, or a plurality of the methods may be combined to be used. Examples of bonding methods are thermal bonding and needle punching. However, it is not specifically limited and spun lace formed by water-flow interlacing treatment can be also used preferably.

When forming the mini sheet piece using the plastic sheet, a sheet of thermoplastic resin (PE, PP, PET, polylactate, polybutylene succinate and the like), and a perforated foamed material and the like can be used. As the method for providing stretching characteristic or flexibility to the mini sheet piece in the lateral direction, the mini sheet piece may be formed of a fiber sheet or film sheet using thermoplastic

mm in width and 50 mm in length, is left for 30 minutes at a room temperature (20° C.) beforehand. Subsequently, the polyethylene film 32 is put lightly over a stainless plate 31 so that the adhesive 33 comes to be in contact with the stainless plate 31, and a roller is applied once (one way only) at 30 g/cm² pressure. Then, it is left for 30 minutes at a room temperature (20° C.) to fabricate a test piece.

The polyethylene film 32 part of the test piece obtained as described is used. In the separation force test of the adhesive, it is separated in the pulling direction of arrow A in Fig. 25 (180° separation) and, in the shearing force test of the adhesive, it is pulled in the pulling direction of arrow B in Fig. 26. The test condition is provided to be 100 mm/min testing speed.

In the case where the forces are measured by the measurement method described above, it is preferable that the measurement value of the separation force be 100 to 2000 mN/25 mm and that of the shearing force be 3000 to 15000 mN/25 mm, in consideration of the burden imposed on the skin of the wearer.

It is preferable to cover the part where the adhesive is applied with a sheet which is obtained by coating silicone resin on a tissue paper, which is a generally obtainable separate paper, or a sheet obtained by coating silicone resin on a film. Thereby, damages or separation of the adhesive part can be prevented while being preserved.

Structure of Interlabial Pad to Which Biodegradability, Water Dispersibility, Water Solubility are Provided

It is preferable that the interlabial pad according to the present invention be formed of a biodegradable material and/or a water soluble material and/or a water dispersible material. Such pad can be dropped and flushed down to the toilet. Therefore,

the pad can be easily and sanitarily discarded and trashes in the toilet can be further decreased at the same time.

In this Specification, "biodegradability" means that a substance is decomposed into gas such as carbon dioxide or methane, water, and biomass under anaerobic or aerobic condition according to the natural process under the existence of bacteria represented by actinomycetes and other microbes, and also means that the biodegradability (biodegradable rate and biodegradable degree) of the substance equals to a material naturally generated such as fallen leaves or a synthetic polymer generally recognized having the same biodegradability under the same environment. "Water dispersibility" has the same meaning as water solubility. It means a characteristic in which, while having no influence when used in a limited amount of moisture (menstrual blood), in a large amount of water or water current, the fabric is easily dispersed into small pieces at least to a degree where an ordinal toilet plumbing is not clogged. "Water solubility" is a characteristic in which, while having no influence when used in a limited amount of moisture (menstrual blood), the fabric is soluble in a large amount of water or water current.

Surface Side Sheet

As the material for the surface side sheet for providing biodegradability, water dispersibility and water solubility, the spun lace nonwoven fabric can be used. It is preferable to use a wet spun lace nonwoven fabric with the fiber length of 1 to 15 mm. As other materials, so-called biodegradable resin such as polylactate and polybutylene succinate can be used. For example, a melt blown nonwoven fabric fabricated using polylactate as the raw material with a specific weight per unit area of 20 to 60 g m² or a

spun bond nonwoven fabric with the fineness of 1:0 to 3.0 dtex and a specific weight per unit area of 15 to 30 μm^2 can be preferably used. Other material which can be used is a fiber obtained by providing tow with a specific weight per unit area of 10 to 80 g/m^2 , which is a filament or continuous fiber of acetate, rayon, or synthetic fiber, and then disentangling the fibers.

Absorber

As the material for the absorber for providing biodegradability, water dispersibility, and water solubility, the same material as that of the permeable surface side sheet can be used. It is also possible to use a single material selected from the group comprising an absorbing material such as algin soda, starch, carboxymethyl cellulose, a highly absorptive polymer grains and fibers. Or a sheet, which is obtained by mixing it with the same material as that of the above-described surface side sheet and forming it into a sheet, can be also used.

A specific example of the structure of the absorber, for example, is a material prepared by enclosing timber pulp by laminating it with a specific weight per unit area of 150 to 500 g/m^2 to tissue and prepare it to have a thickness of 2 to 10 mm by a pressing device. By mixing 5 to 30 g/m^2 of an absorbent such as starch with the above-mentioned absorber, it is possible to also improve the absorbance and menstrual blood holding capacity.

Back Side Sheet

Examples of the impermeable material for the back side sheet which can provide biodegradability, water dispersibility, and water solubility at the same time are a polyvinyl alcohol (PVA) film, a film sheet in which repellent is applied by silicone resin

or the like on the whole area or a part of one surface or both surfaces of the PVA film, a PVA film to which a silicone resin is mixed, a starch film, a film formed using so-called a biodegradable resin such as polylactate or polybutylene succinate, and a laminated paper such as tissue. If necessary, coloring may be applied by mixing mineral pigment of 0.1 to 5 percent to these materials.

A specific example of the structure of the back side sheet is a laminated paper obtained by laminating a film formed of polylactate and tissue with a thickness of 10 to 20 μm and a specific weight per unit area of 20 to 50 g/m^2 by the laminating area ratio of 5 to 40 percent. Such laminated paper is preferable in respect that the impermeability can be maintained even when the pad is wet and there is no excessive burden imposed on septic tanks.

Mini Sheet Piece

Examples of the material for the mini sheet piece for providing biodegradability, water dispersibility, and water solubility are a film formed of polylactate, polybutylene succinate, PVA and the like, or a laminated material obtained by laminating a film formed of these material and tissue.

Bonding Method

As the applicable bonding method for providing biodegradability, water dispersibility, and water solubility, bonding by polyvinyl alcohol with water solubility or water dilatation characteristic, heat sealing, hydrogen bonding may be used alone or combined to be used properly as a bonding method.

Functions

The function regarding suppression of the number of live microorganism will be described by referring to sterilization as an example.

In the embodiment of the present invention, by sterilizing the interlabial pad packed in the individual wrapping body and the package through using gas and the like, it made possible to zero the number of the live microorganism in the interlabial pad immediately after the sterilization. Also, in the case where it is provided to have an over-wrapping structure in which contaminations hardly enter to the exterior container before opening, it becomes possible to suppress the number of the live microorganism in the interlabial pad to 100 or less in a period of 6 months after the sterilization. Furthermore, as for the exterior container, after opening, even being repeatedly opened and closed, the lid can cover the opening of the container so that the entering of contaminations can be suppressed as much as possible. Therefore, even after being opened by a user, the sanitary state of the outer environment of the sterilized interlabial pad enclosed in the individual wrapping body can be maintained.

Next, the function, which makes it possible to maintain the sanitary state of the interlabial pad while the user takes out the interlabial pad and wears it, will be described. The sterilized interlabial pad is enclosed in the individual wrapping body to which contaminations hardly enter so that the sanitary state is maintained. When the user opens the individual wrapping body, an interlabial pad whose surface side sheet hardly comes to be in contact with the finger appears from the opening of the individual wrapping body. Thereby, the user can take it out from the individual wrapping body and fix it between

the labia without touching the surface side sheet of the interlabial pad by a finger and the like.

In addition, in the case where there is an opening for inserting a finger provided in the sterilized interlabial pad, it is possible to take out the pad while wearing the interlabial pad to the finger tip. Therefore, it can be precisely fixed between the labia as will be described later.

In the embodiment of the present invention, disclosed is an interlabial pad which is inserted between the female labia capable of directly adsorbing menstrual blood from the private part of the body. The sterilization is performed on the interlabial pad so that the number of live microorganism is suppressed to 100 or less even 6 months after the date of manufacture. By providing a using method in which, when the user of the interlabial pad fixes it between the labia, the contact with microorganism can be suppressed right before the skin-contact surface (surface member) of the interlabial pad touches (fix) the labia. That is, the wearing performance is provided in which a finger and the like, where indigenous microorganism thrive, do not touch the skin-contact surface (surface member) of the interlabial pad so that the state of equilibrium of indigenous microorganism near the labia of the user can be maintained when using the interlabial pad.

The functions other than the suppression of the number of live microorganism will be described below in order. The function of the surface side sheet is described. In the interlabial pad, the surface side sheet can permeate liquid so that the liquid discharged from the body can be immediately transmitted to the absorber.

Also, by fixing the interlabial pad to the body through adhesive on the surface side sheet, the gap generated between the interlabial pad and the body can be decreased without being influenced by the body movements. Thus, it becomes possible to completely shield the leak from the gap in the interlabial pad.

As the function of the absorber, it absorbs and holds the liquid permeated through the surface side sheet.

The functions of the back side sheet and the mini sheet piece will be described. The back side sheet has a sheet structure so that insert of the finger tip is not to be interrupted. When wearing, there may be cases where there is a decrease in the finger insert property caused by an increase in the friction drag between the inner side of the finger tip and the back side sheet due to the wet environment inside the finger tip to be inserted, or there is a fitting shift due to deterioration of the finger pulling property after wearing the interlabial pad. However, by reducing the surface contact area through performing a surface concave-convex processing on the back side sheet surface, changes in friction or sticking between the back side sheet and the finger tip, which is generated by the changes in the environment of the finger tip such as wet state or the like, can be avoided.

Unlike the product like napkins which are fixed to an underwear, when wearing the interlabial pad which is fixed to the body, it is hard to recognize the wearing position target (space between the labia or near the ostium of vagina). In the embodiment of the present invention, by having a structure in which a finger can be easily inserted, the interlabial pad can be temporarily held by the inserted finger, and the finger can be easily pulled out after wearing it between the labia, it becomes possible, when the wearer fixes

the interlabial pad to the space between the labia, to have the inner side of the finger tip of the wearer with a keen sense be fixed facing the space between the labia of the wearer (or near the ostium of vagina). Therefore, even to the space between the labia which is hard to be viewed, the ostium of vagina can be detected by a natural act. As a result, not only simplifying the leading of the product to the right position but also a decrease in the leak due to wearing in a wrong position can be achieved.

Also, when inserting the finger tip to the interlabial pad, there may be a case where the inner side of the finger tip does not face the back side sheet but others. However, by opening (that is, the opening for inserting a finger is open) the periphery of the opening for inserting a finger of the interlabial pad in the projection from the front of the product, it becomes unnecessary for the wearer to insert the finger tip by opening the insertion opening through turning the finger or the like. Thereby, it becomes possible to have the finger tip with a keen sense readily facing the back side sheet (that is, the space between the labia or near the ostium of vagina) to be inserted.

Furthermore, by reducing the surface contact area of the mini sheet piece as in the same manner as the back side sheet, the influence by the changes in the wet environment of the finger tip can be avoided.

Also, by providing an elastic flexibility at least in the right and left hand side direction of the mini sheet piece, regardless of the finger tip size of the wearer, the interlabial pad can be temporarily fixed (held) to the finger tip and, without influencing the wearing state, the finger can be easily pulled out.

Also, the mini sheet piece from which the finger tip is pulled out is likely to be folded to the opposite side to the body by the wearing action due to its structural feature.

Hence, when removing the used interlabial pad, the handling becomes easy by grabbing the mini sheet piece. Also, by providing the impermeability thereto, the mini sheet piece can be handled sanitarily without contaminating the finger.

The interlabial pad of the present invention may be used together with a sanitary napkin. There are some sanitary napkin users who use several pieces of napkins stacked together when there is a large quantity of menstrual blood, however, there causes problems that it feels uncomfortable such as stiffness and affects the external appearance. Also, the stacked sanitary napkins are put on one after another even near the ostium of vagina where there is no need for the stacked napkins, which causes rash and stuffiness. However, according to the embodiment, the sanitary products are stacked only in the area between the labia. Therefore, there is little influence on the wear feeling and the external appearance. Also, rash and stuffiness in the breech and its periphery can be decreased.

Furthermore, when changing the pad, it becomes possible to change only the interlabial pad according to the present invention without changing the sanitary napkin. Therefore, there is no need for the wearer to carry around the sanitary napkins which are large enough to be noticed.

In the present invention, the interlabial pad is wrapped anisotropic to the wrapping container. Therefore, the opening direction and the finger insert direction can be made in the same direction for the wearer so that the wearer can insert the finger more easily.

The interlabial pad 1 according to the embodiment can be used together with an ordinal sanitary napkin. As the wearing method, the interlabial pad is fixed between the labia and the sanitary napkin is fixed to the underwear. Thereby, even on a day with a

container was kept at 50° C. for 4 hours to be pasteurized. Subsequently, the ethylene oxide gas was removed from the interlabial pad. When removing, the inner pressure was decreased to be -91.2 kPa or less and then air was introduced to restore the pressure to the atmospheric pressure. This operation was performed once.

Sterility Test was carried out as follows. The medium used is based on Japanese version of the Japanese Pharmacopoeia, Fourteenth Edition, General Tests, No. 59 Sterility Test (No. 54 in English version). The testing method employs a direct method and the basic operation follows the above-described testing method.

For the preparation of test solution, the prepared medium is inserted to cultural test tubes of .phi. 30 mm.times.120 mm by 45 ml each and caps provided exclusively were applied. The tubes were autoclaved at 121° C. for 20 minutes. After cooling, one piece of the interlabial pad was inserted (tested in two tubes per test sample).

Subsequently, according to Pharmacopoeia, the tubes were left in an incubator for 14 days for cultivation.

Cultivation was performed on a thioglycolate acid medium at 30 to 35° C. and on SCD medium at 20 to 25° C. Observation and judgment were performed according to Pharmacopoeia.

A microbe limit test was carried out as follows. The medium used was based on Japanese version of the Japanese Pharmacopoeia, Fourteenth Edition, General Tests, No. 50 Microbial Limit Test (No. 35 in English version).

Soybean casein digest (SCD) agar culture medium and antibiotic-added Sabouraud dextrose agar culture medium were prepared.

